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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/818,324	03/26/2001	Nancy E. Iwamoto	30-5009 (4960)	1114

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EXAMINER	
MAYES, MELVIN C	
ART UNIT	PAPER NUMBER
1734	

DATE MAILED: 09/18/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/818,324	Applicant(s) IWAMOTO ET AL.	
	Examiner Melvin Curtis Mayes	Art Unit 1734	

-- Th MAILING DATE of this communication appears n th cov r sh t with th correspond nc address --

Period for R ply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) *1-12* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *13-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

(1)

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-12, drawn to an IC assembly, classified in class 257, subclass 700+.

II. Claims 13-21, drawn to a method for coupling an IC to a supporting surface, classified in class 156, subclass 235.

(2)

The inventions are distinct, each from the other because of the following reasons:

Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case , the process as claimed can be made to make other and materially different product such as one without traces of release coating and the product as claimed can be made by another and materially different process such as forming a thermoplastic interconnect on a release coated surface, removing the interconnect from the surface, placing between the IC and supporting surface and heating to soften the interconnect for bonding.

(3)

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

(4)

During a telephone conversation with Robert Fish on February 13, 2002, a provisional election was made without traverse to prosecute the invention of Group II, claims 13-21. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-12 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

(5)

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Objections

(6)

Claim 19 objected to because of the following informalities: "particle" should read "particle." Appropriate correction is required.

Claim Rejections - 35 USC § 112

(7)

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

(8)

Claims 13-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 13 claims "peeling away the sacrificial layer" of a perform assembly comprising a base layer and a sacrificial layer but then claims "sandwiching the **peeled pre-form assembly**." Does Applicant mean "sandwiching the **base layer**" since it is the base layer of the pre-form assembly which is sandwiched, and not the pre-form assembly (which has a sacrificial layer) nor the peeled sacrificial layer? The claim is unclear.

Claim Rejections - 35 USC § 103

(9)

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

(10)

Claims 13-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Calhoun et al. 5,275,856 in view of Chung 6,399,178.

Calhoun et al. disclose a method of interconnecting electrodes of two electrical devices such as circuit and a printed circuit board comprising: providing an electrically conductive adhesive tape comprising a releasable carrier web having a low-adhesion face (such as paper having polymeric coating) bearing thereon an adhesive layer; applying the tape to one substrate; removing the carrier web; and applying the second substrate. The adhesive can be a thermosetting adhesive and useful materials which can be blended into the adhesive include fillers and woven and nonwoven fabric. The electrically conductive adhesive tape is made by coating and curing adhesive on the carrier web, laser perforating the adhesive layer, and applying slurry containing conductive particles into the perforations (col. 2-9).

Chung teaches that an adhesive perform film or sheet of thermosetting adhesive for bonding electronic components is dried or B-staged to facilitate handling and lamination to a device or substrate. Chung teaches that fillers that are added to enhance the thermal conductivity of the adhesive include alumina, etc. (col. 8, lines 46-55, col. 10, lines 31-41).

It would have been obvious to one of ordinary skill in the art to have bonded an integrated circuit and printed circuit board in the method of Calhoun et al. by curing the adhesive because Calhoun et al. disclose that the adhesive can be a thermosetting adhesive and thermosets bond by curing. Curing the adhesive to a B-stage before laser perforating to provide the adhesive layer with perforations for the conductive slurry, as claimed in Claim 14, would have been obvious to one of ordinary skill in the art, as taught by Chung to facilitate handling of the thermosetting adhesive yet leave the thermosetting adhesive not completely cured to enable bonding of the integrated circuit and printed circuit board.

It would have been obvious to one of ordinary skill in the art to have provided the filler blended into the thermosetting adhesive as thermally conductive particle filler, as taught by Chung, to enhance the thermal conductivity of the adhesive. By providing the filler as alumina, as taught by Chung to enhance thermal conductivity, a particle filler that is thermally conductive and electrically non-conductive, as claimed in Claims 20 and 21, is obviously provided.

(11)

Claims 13 and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukagoshi et al. 4,740,657.

Tsukagoshi et al. disclose a method for connecting conductors such as integrated circuits with wiring substrates comprising: forming an adhesive film of adhesive composition containing electroconductive particles on a separator made of paper or film treated with release treatment; preliminarily adhering the adhesive film to one of the conductors; peeling the separator; placing the other conductor on the adhesive film; and bonding by heat. Tsukagoshi et al. disclose that the adhesive composition can be thermosetting and disclose that in the adhesive film, it is possible to

use a core material such as non-woven fabric for reinforcing the adhesive and to provide spacer particles such as electroconductive nickel particles or insulating silica powder (col. 1, lines 9-17, col. 3, lines 38-58, col. 8, line 10 – col. 10, line 38, col. 11, lines 14-34, Example 37 and 38).

It would have been obvious to one of ordinary skill in the art to have bonded the integrated circuit and wiring substrate by curing the adhesive composition because Tsukagoshi et al. disclose that the adhesive composition can be thermosetting and thermosets bond by curing.

By providing spacer particles such as nickel particles or silica powder in the adhesive film, particle filler that is thermally conductive and/or electrically non-conductive and intermixed with the thermoset, as claimed in Claims 20 and 21, is obviously provided.

Conclusion

(12)

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The references disclose electrical connectors.

(13)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvin Curtis Mayes whose telephone number is 703-308-1977. The examiner can normally be reached on Mon-Fri 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on 703-308-3853. The fax phone numbers for the

organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Melvin Curtis Mayes
Primary Examiner
Art Unit 1734

MCM
September 17, 2002